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THE PREVALENCE OF FISSURED TONGUE IN 2050 INDIAN PATIENTS: A CROSS SECTIONAL STUDY

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ABSTRACT

Background

The tongue is an accessible organ of oral cavity and is an indicator of oral and general health. Fissured tongue is a condition seen on the dorsal surface of the tongue which is characterized by the presence of shallow or deep grooves.

Objectives

The objective of this study was to determine the prevalence of fissured tongue and most prevalent pattern of fissured tongue in patients visiting the Vydehi Institute of Dental Sciences and possible association between occurrence of these fissures and sex, habits, medical illness, and symptoms.

Methods

Cross sectional Study was conducted consisting of 2050 patients visiting the outpatient department between years January 2010 to March 2011. All the participants were interviewed for their medical history, symptoms related to tongue lesions, habit history and examined for the presence or absence of fissure and pattern of fissure.

Results

Overall tongue fissures were present in 80.68%. Most prevalent pattern of fissure found to be central longitudinal fissuring (35.06 %), while least prevalent was double fissures (1.70 %) pattern.

Conclusions

Fissured tongue is relatively common condition. In our study, overall prevalence rate was high as compared to the previous studies.

KEYWORDS: Tongue, fissured tongue, central longitudinal fissuring, tongue lesions.

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Original Article

INTRODUCTION

Fissure tongue is also termed as lingua fissurata, lingua plicata, or scrotal tongue presents as groove oriented anteroposteriorly, often with multiple branch fissures extending laterally. [1] This malformation exhibits varied pattern on tongue with depth ranging from 2 millimeter. The fissured tongue has been associated with psoriasis, acromegaly, and Sjogren's, Down's and Melkerson–Rosenthal syndromes. [2]

Various epidemiological studies have been conducted on the prevalence of tongue lesions in different parts of the world including United States of America (Shulman and Carpenter 2006) [3], Hungary (Banoczy et al 1993) [4], Jordan (Darwazeh and Pillai, 1993) [5], Malaysia (Koay CL etal 2011) [6]. Numerous studies have also

been conducted regarding the prevalence of oromucosal lesions in Turkey (Avcu and Kanli 2003) [7], Brazil (Dos Santos et al 2004) [8], Turin (Pentenero M et al 2008) [9] and in India (Mathew AL etal 2008, Patil S et al 2013, and Omal PM et al 2011). [10, 11] Epidemiologic studies can provide better understanding of the prevalence, extent and severity of fissured tongue. Reported occurrence of fissured tongue among these studies varies considerably, perhaps due to variations in the ethnicity, geographical differences, design of the study, diagnostic criteria used for the study, and gender variations in the study samples. We conducted our study in India which is geographically located in continent Asia, is made up of different ethnic groups, socioeconomic and living conditions. The objective of this study was to determine the prevalence of fissured tongue and most prevalent pattern of fissured tongue in patients visiting the outpatient department of Vydehi Institute of Dental Sciences and possible association between occurrence of these fissures and sex, habits, medical illness, and symptoms.

METHODS

Study Population

After receiving approval from ethical committee of the college, cross sectional Study was conducted in the department of Oral Medicine and Radiology of Vydehi institute of Dental Sciences and research center. The study consisted of 2050 patients visiting the outpatient department between years January 2010 to March 2011. After obtaining consent from the patients participating in the study, two examiners who were trained in Oral Medicine interviewed the patients and performed all the clinical examinations.

Data Collection

All the patients were interviewed for recording the details on age, gender, medical history, habit history (use of smoking form of tobacco, smokeless form of tobacco and alcohol) and if any symptoms present related to the fissured tongue (burning mouth, halitosis, food lodgement, difficulty in cleansing and taste changes). The patients were grouped into seven groups based on their ages from birth to 85 years. Tongue examination was performed according to the guidelines provided by the WHO aided by dental light, mouth mirrors, probe, and gauze. The diagnosis of fissured tongue was based solely on the history and clinical features and criteria determined by who and no biopsy or cytology was performed. [9, 10]

Tongue was examined for presence or absence of fissures. When fissures were present, depending on the pattern of fissure, they were classified into following types: (based on classification given by AG Farman 1976) (Figure 1) [13]

Type I: Placation

Type II: Central longitudinal fissuring

Type III: Double fissures

Type IV: Transverse fissures arising from a central fissure

Type V: Transverse fissures without a central fissure

Type VI: Lateral longitudinal fissures

Combinations of above types were considered under other types. Depth of the fissure was measured using Williams periodontal probe and was classified as deep (more than 2 mm) and shallow (less than 2 mm). In those patients

who had more than one variety of patterns or who had variable depth, deepest depth was considered. Both the examiners examined the tongue for the presence or absence of fissure or pattern or depth of fissure and arrived at common decision, and thus data was collected and single data sheet was prepared containing the fissure patterns and other details.

Statistical analysis

The data were compiled and analyzed using Statistical Package for Social Sciences software (SPSS software package version 22). Chi-square test was applied to compare the occurrence of fissured tongue with age, gender, medical history and habits. The level of significance was set at $P<0.05$.

RESULTS

A total of 2050 dental out-patients divided into 1254 (61.2%) males and 796 (38.8 %) females were included in the study. The subject's age ranged from one year to 84 years with mean age of 35.15 years. Overall tongue fissures were present in 80.6%. The tongue fissure found to be least prevalent in the age group of 0-9 years age group, and most prevalent in the group of 71-80 years. Statistical analysis showed that the prevalence of the fissured tongue was significantly increasing with age ($P<0.001$) (Table 1, Graph 1). In general, the prevalence of tongue lesions was significantly higher among males (82.70%) compared to females (77.50%), which was statistically highly significant ($P<0.001$) (Table 2).

There was no significant association between systemic disorder and presence of fissured tongue. Likewise, association of fissured tongue with any specific systemic condition was statistically insignificant (Table 3). Prevalence of fissured tongue in patients with alcohol habit, tobacco smoking habit and tobacco chewing habit were 0.70%, 9.10% and 5.30% respectively, all were statistically insignificant (Table 4, 5, and 6). In our study 99.9% of patients were asymptomatic and only 0.1% patients were symptomatic. 77% of patients had shallow fissures as compared to 31% who had deep fissures (Table 7). Most common site of occurrence of fissured tongue was anterior and middle portion of the tongue (Table 8). Most prevalent pattern of fissure found to be central longitudinal fissuring (35.06 %), while least prevalent was double fissures (1.70 %) pattern (Table 9, Graph 2).

DISCUSSIONS

To best of our knowledge, there is no published data on epidemiological evaluation on fissured tongue and its association with age, gender, medical history, habits and prevalence of different pattern of fissured tongue and correlation with depth and symptoms of fissure. According to the literature, the frequency of tongue lesions shows a wide variability. [14] Among 2050 patients, tongue fissures were present in 80.68%. Khozeimeh F et al observed in 11.8% of fissured tongue in 1540 subjects. [15] Darwazeh AM found a prevalence of 11.5% among 2000 Jordanian population. [16]; prevalence (27.3%) was reported in Brazil [8]; Byahatti SM found that fissured tongue was most prevalent tongue lesion among 320 Lybian adults (48.4%) [17]. Variations in frequency of fissured tongue may be attributed to the different diagnostic criteria used by the examiners, differences in the race, ethnicity, sex and age of samples, in addition to the general health status of the study population and differences in methodologies and procedures used by different researches.

In general we found increase in the prevalence of fissures with increasing age (table 1). This was also observed by Kovac-Kovacic M [18], Darwazeh AM et al. [16] The prevalence fissured tongue found to be increasing with age may be attributed to some factors such as salivary hypo function, possibly vitamin B deficiency, candidiasis , and chronic (plaque like) lichenoid lesions in elderly patients. [19, 20, 21] Fissured tongue was more prevalent among men than in women in our

population which is in accordance with findings of Aboyons and Ghaemma Ghami in Ljubljana [18] and Darwazeh and Pillai in Jordan. [16]

Pattern of Fissured Tongue

Most prevalent pattern of fissure found to be central longitudinal fissuring (35.6 %). In our study distribution of other patterns were 4.0 % of placation pattern; transverse fissures arising from a central fissure (9.8%); transverse fissures without a central fissure (9 %); double fissure (1.70%) and lateral longitudinal fissures (9.30 %). PM Omal conducted a cross sectional study to identify prevalence of fissured tongue occurring alone and in association with Syndromes. Out of 358 patients who had fissured tongue prevalence of single midline fissuring (central longitudinal fissuring) was 13 % and other fissuring patterns were 87 %. [12] Yarom N, Cantony U, and Gorsky M studied the prevalence of fissured tongue, geographic tongue and median rhomboid glossitis among the adult Israeli Jewish urban, rural and industrial populations of different ethnic origins and found that prevalence of fissured tongue was 30.5%. They further classified fissured tongue into mild, moderate, typical and central.The most prevalent pattern in their study was typical fissured tongue, grooves over one third of the dorsal tongue, and was noted in 11.5%. [22]

Medical History

There was no significant association between systemic disorder and presence of fissured tongue. Among the specific systemic conditions, 22.10% and 19.50% of fissured tongue was found to be in patients with diabetes mellitus and hypertension. In contrast to our study, study by Koay CL et al found significant association between fissured tongue and systemic diseases (59.3%; $P<0.05$) in Malaysian patients. [6] Studies by Albrecht et al and Koay et al also found significant association between fissured tongue and diabetes mellitus. [6, 23] We were unable to demonstrate any link between prevalence of fissured tongue and specific systemic condition.

Habits

In our study, we did not find any association between different habits like tobacco smoking, tobacco chewing or alcohol usage. This correlated with the study by Koay CL et al who found out of 83 fissured tongue patients, 81.5% were non-smokers while 18.5% were smokers ($P<0.05$). [6] We could not gather much detailed information regarding the frequency and duration of the habits.

Symptoms and Depth

Symptoms may be related to the depth of the fissures, i.e., deep fissures are more symptomatic as compared to shallow fissure. But in our study only 2 patients (64 year old female patient who was anaemic and 21 year old female patient) were symptomatic (burning tongue) and both had shallow fissures. This was in contrast with the study conducted by Darwazeh AM et al who observed 23% of the subjects with fissured tongue reported symptoms like soreness with acidic food and drinks. [16] Fissured tongue is usually asymptomatic, but may become symptomatic if fissures were deep enough to retain food debris in their base, which become reservoir for bacteria and subsequently inflamed.

CONCLUSIONS

Fissured tongue is relatively common condition. Through this study we have tried to focus on the prevalence of fissured tongue and its occurrence in association with age, gender, medical history and habits. In our study, overall prevalence rate was high as compared to the previous studies. We observed that occurrence of fissured tongue increased

with age. In our study, occurrence of fissured tongue showed no association with any specific systemic condition and habits. The data also revealed that fissured tongue is asymptomatic in most of the patients. The fact that, the high prevalence of fissured tongue emphasizes the importance of setting up routine inspections of the tongue, so as to maintain good oral and general health of individuals

REFERENCES

1. *Zargari O. The prevalence and significance of fissured tongue and geographical tongue in psoriatic patients. Clin Exp Dermat 2006:31:192–5.*
2. *Roger RS III, Bruce AJ. The tongue in clinical diagnosis. J Eur Acad Derm Venereol 2004; 18: 254–9.*
3. *Shulman JD Carpenter WM. Prevalence and risk factors associated with geographic tongue among US adults. Oral Dis. 2006; 12(4):381-6.*
4. *Banoczy J, Rigo O, Albrecht M. Prevalence study of tongue lesions in a Hungarian population. Community Dent Oral Epidemiol 1993; 21:224–6.*
5. *Darwazeh AMG, Pillai K. Prevalence of tongue lesions in 1013 Jordanian dental outpatients. Community Dent Oral Epidemiol 1993; 21:323-4.*
6. *Koay, C. L, Lim, J. A. Siar, C. H. The prevalence of tongue lesions in Malaysian dental outpatients from the Klang Valley area. Oral Dis 2011; 17: 210-6.*
7. *Avcu N, Kanli A. The prevalence of tongue lesions in 5150 Turkish dental outpatients. Oral dis 2003; 9(4):188-95*
8. *Dos Santos PJ, Bessa CF, de Aguiar MC, do Carmo MA. Cross-sectional study of oral mucosal conditions among a central Amazonian Indian community, Brazil. J Oral Pathol Med. 2004; 33:7-12.*
9. *Pentenero M , Broccoletti R, Carbone M, Conrotto D, Gandolfo S. The prevalence of oral mucosal lesions in adults from the Turin area. Oral Dis. 2008;14(4):356-66*
10. *Mathew AL, Pai KM, Sholapurkar AA, Vengal M. The prevalence of oral mucosal lesions in patients visiting a dental school in Southern India. Indian J Dent Res. 2008;19(2):99-103.*
11. *Patil S, Kaswan S, Rahman F, Doni B. Prevalence of tongue lesions in the Indian population. J Clin Exp Dent. 2013; 5(3):e128-32.*
12. *Omal PM, Prathap A, Mathew N. Prevalence of fissured tongue occurring alone and in association with Syndromes – A Cross sectional study. Kerala dental journal 2011. 34(1): 26-8*
13. *Farman AG. Tongue fissures. A classification and comparative prevalence study among 825 European Caucasian and 605 Xhosa Negro school children. J Biol Buccale. 1976 Dec; 4(4):349-64.*
14. *Voros-Balog T, Vincze N, Banoczy J (2003). Prevalence of tongue lesions in Hungrian children. Oral Dis 9: 84-7.*
15. *Khozeimeh F, Rasti G. The Prevalence of Tongue Abnormalities among the School Children in Borazjan, Iran. Dent Res J 2006; 3(1):1-5.*
16. *Darwazeh AM, Almelaih AA. Tongue lesions in a Jordanian population. Prevalence, symptoms, subject's knowledge and treatment provided. Med Oral Patol Oral Cir Bucal. 2011 Sep 1; 16 (6):e745-9.*
17. *Byahatti SM, Ingafou MSH. The Prevalence of Tongue Lesions in Libyan Adult Patients. J Clin Exp Dent. 2010; 2(4):e163-8.*
18. *Kovac-Kovacic M, Skaleric U. The prevalence of oral mucosal lesions in a population in Ljubljana, Slovenia. J Oral Pathol*

Med. 2000; 29:331-5.

19. *Glenert U, Pindborg JJ , Andreasen Jo. Tongue surface conditions of 478 residents of a large Danish rest Home. Gerodontics 1986;2(3): 82-6.*
20. *Bertran U. Xerostomia: studies on salivary secretion. Acta Odontol Scand. 1967; 25:13.*
21. *Kullaa-Mikkonen A, Jarvinen J. Effects of age, sex and salivary secretion on the human tongue surface. Gerodontics. 1988;4(3):150-3*
22. *Yarom N, Cantony U, Gorsky M. Prevalence of fissured tongue, geographic tongue and median rhomboid glossitis among Israeli adults of different ethnic origins. Dermatology. 2004;209(2):88-94*
23. *Albrecht M, Banoczy J, Dinya E, Tamaa Gy (1996). Occurance of oral mucosal lesions in diabetes mellitus. ForgorvSz; 89:385-98*

APPENDICES

Table 1: Age wise Prevalence of Fissured Tongue [N=2050]

Age Wise Prevalence of Fissured Tongue [N=2050]				Chi-Square Value	P-Value
Age Group	Distribution	Yes	No		
0_10	N	33	32	77.845	<0.001*
	%	50.80%	49.20%		
11_20	N	172	72		
	%	70.50%	29.50%		
21_30	N	525	122		
	%	81.10%	18.90%		
31_40	N	329	82		
	%	80.00%	20.00%		
41_50	N	281	51		
	%	84.60%	15.40%		
51_60	N	193	30		
	%	86.50%	13.50%		
61_70	N	95	6		
	%	94.10%	5.90%		
71_80	N	26	1		
	%	96.30%	3.70%		

Table 2: Gender Wise Distribution of Fissured Tongue [N=2050]

Gender	Distribution	Yes	No	Chi-Square Value	P-Value	Odds Ratio	95% CI	
							Upper	Lower
Males	N	1037	217	8.392	0.004*	1.38	1.11	1.73
	%	82.70%	17.30%					
Females	N	617	179					
	%	77.50%	22.50%					

Table 3: Association of Fissured Tongue with Medical History

MH	Distri	Yes	No	Chi Square Value	P-Value
Anaemia	N	1	0	12.219	0.836
	%	0.90%	0.00%		
Asthma	N	7	1		

	%	6.20%	4.30%		
Diabetes	N	25	4		
	%	22.10%	17.40%		
Down's Syndrome	N	3	0		
	%	2.70%	0.00%		
Gastritis	N	3	0		
	%	2.70%	0.00%		
Arthritis	N	1	0		
	%	0.90%	0.00%		
Psoriasis	N	1	0		
	%	0.90%	0.00%		
HTN	N	22	7		
	%	19.50%	30.40%		
Cardiac Problem	N	22	6		
	%	19.50%	26.10%		
Thyroid	N	7	4		
	%	6.20%	17.40%		
Asthma + HTN	N	2	0		
	%	1.80%	0.00%		
Diabetes + HTN	N	10	0		
	%	8.80%	0.00%		
Diabetes + HTN + Cardiac Problem	N	1	1		
	%	0.90%	4.30%		
Diabetes + HTN + Thyroid	N	2	0		
	%	1.80%	0.00%		
Renal Problem + HTN	N	1	0		
	%	0.90%	0.00%		
Diabetes + Thyroid	N	1	0		
	%	0.90%	0.00%		
Renal Problem + Cardiac Problem	N	1	0		
	%	0.90%	0.00%		
Diabetes + Cardiac Problem	N	1	0		
	%	0.90%	0.00%		
HTN + Cardiac Problem	N	2	0		
	%	1.80%	0.00%		

Table 4: Association of Fissured Tongue with Alcohol Usage

Alcohol	Distribution	Fissure		Fisher Exact Value	P-Value
		Yes	No		
No	N	1643	394	0.130	1.000
	%	99.30%	99.50%		
Yes	N	11	2		
	%	0.70%	0.50%		

Table 5: Association of Fissured Tongue with Tobacco Smoking Habit

Tobacco Smoking	Distribution	Fissure		Fisher Exact Value	P-Value
		Yes	No		
No	N	1504	372	3.723	0.056
	%	90.90%	93.90%		
Yes	N	150	24		
	%	9.10%	6.10%		

Table 6: Association of Fissured Tongue with Tobacco Chewing Habit

Tobacco Chewing	Distribution	Fissure		Fisher Exact Value	P-Value
		Yes	No		
No	N	1566	381	1.573	0.249
	%	94.70%	96.20%		
Yes	N	88	15		
	%	5.30%	3.80%		

Table 7: Distribution of Fissures Based on Varying Depth

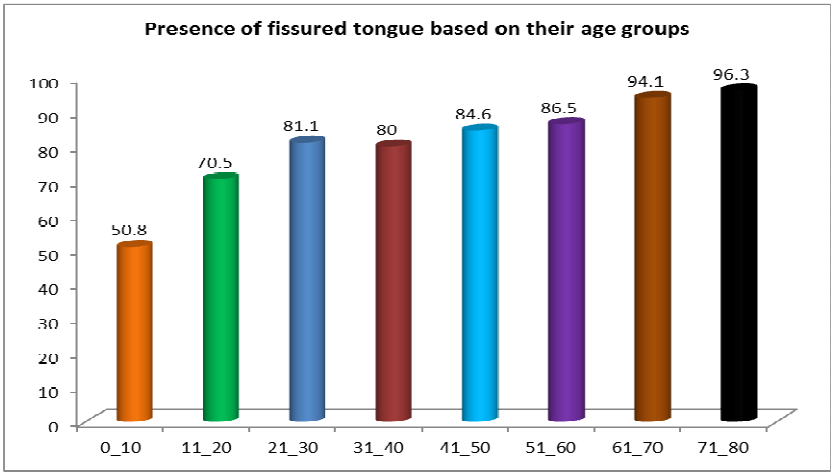
Depth	N	%
Deep	388	31
Shallow	1266	77

Table 8: Site of Occurrence

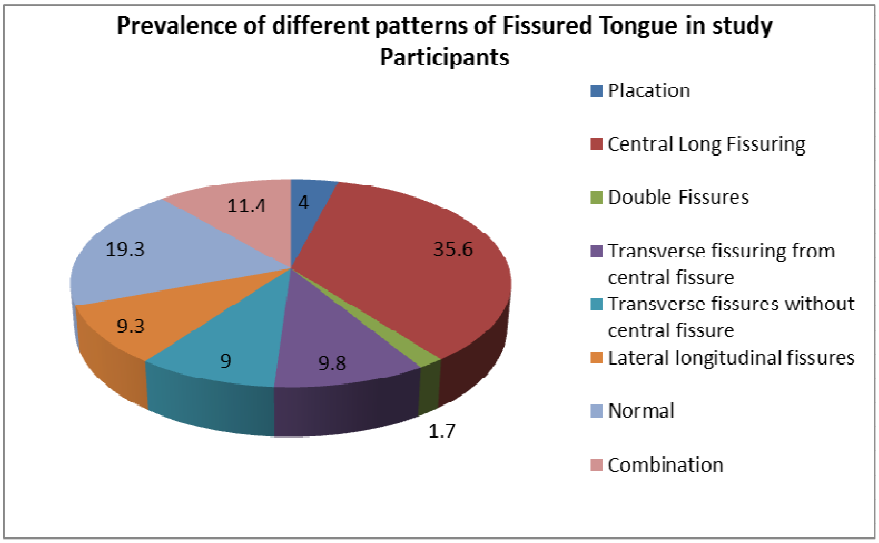
Site of Occurrence	N	%
Anterior	383	18.7
Middle	371	18.1
Posterior	28	1.4
Anterio-Middle	661	32.2
Middle Posterior	53	2.6
Ant-Mid-Posterior	148	7.2
Normal	396	19.3
Anterio-Posterior	10	0.5

Table 9: Different Types of Fissures

Types of Fissures	N	%
Placation	82	4
Central Long Fissuring	730	35.6
Double Fissures	34	1.7
Transverse fissuring from central fissure	200	9.8
Transverse fissures without central fissure	184	9
Lateral longitudinal fissures	190	9.3
Normal	396	19.3
Combination	234	11.4



Graphs 1: Age Wise Prevalence of Fissured Tongue [N=2050]



Graph 2: Prevalence of Different Patterns of Fissured Tongue

Figure legend:

Figure 1: Types of fissures